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1.0 PURPOSE

This Standard Operating Procedure (SOP) addresses the procedure for field decontaminating personnel, equipment, and non-disposable personal protective equipment (PPE). Decontamination is designed to minimize cross-contamination and human-health exposure.

2.0 SCOPE

This SOP/Work Instruction applies to all Environmental Quality Management, Inc. (EQM) personnel; permanent, temporary, and contractors directly assigned to accomplish specific projects or internships under direct EQM operational control. It does not, however, direct or affect the actions of federal, state, local, client, or third-party auditors, assessors, or inspectors.

This document does not displace or supersede any portion of Arctic Slope Regional Corporation Industrial Service's policy and procedure requirements. EQM is solely responsible for this document's content and administration and reserves the right to alter or amend it at any time at its own discretion.

3.0 RESPONSIBILITIES

Because operations may vary considerably between projects, some flexibility is necessary in interpreting the actual functions and relating them to the following responsibilities.

3.1. Health and Safety Director

The Health and Safety Director manages EQM's health and safety programs and is responsible to:

- Determine process requirements and maintaining the SOP.
- Advise field managers on selecting appropriate controls during decontamination to protect from exposures.
- Recommend appropriate PPE based on the hazards presented for decontamination.

3.2. Field Managers

Field managers (e.g., Project Manager, Response Manager, Site Superintendents, and Site Health & Safety Officer) are responsible for the onsite activities and to:

- Perform a hazard assessment prior to work on site to determine appropriate hazard controls and specify any PPE requirements for each project.
- Ensure all programs, plans, and quality assurance (QA) procedures are followed.
- Provide adequate resources and ensuring that field staff have adequate experience and training to successfully comply with and execute project-specific SOPs.
- Implement the project health and safety program.

3.3. Supervisor

Supervisors are the key to ensuring assigned personnel hold the training requisite to their position and are responsible to:

- Delegate decontamination tasks to qualified workers.
- Check all work and verifying it satisfies all decontamination requirements.
- Communicate with field personnel regarding objectives and anticipated situations that require any deviation from the project plans.
- Consult with the field manager if field conditions or the chemical(s) of concern change significantly.

- Verify that subcontractors are taking precautions to decontaminate field equipment before and throughout field activities.

3.4. All Personnel

While these procedures direct the decontamination activities onsite, personnel not directly involved in the decontamination process must remain clear of the decontamination area and not interfere with these operations.

4.0 PROCEDURES

Conduct all decontamination procedures in accordance with the following guidance documents, as applicable:

- Project Health and Safety Plan
- Activity Hazard Analysis
- Project Work Plan
- Field Sampling Plan
- Quality Assurance Project Plan

Decontaminate everything, including personnel, or properly discarded expendables exiting the Exclusion Zone (EZ). Treat and store the material generated during the decontamination process in the same manner as the site's contaminants and in a designated area until arrangements are made for disposal.

In addition:

- Decontaminate non-disposable sampling equipment used both before activities begin and after each sample is collected.
- Decontaminate all heavy equipment both before activities begin and between changing locations.
- Take care that materials and solutions used for decontamination procedures are themselves not hazardous (i.e., are acids and solvents) and could not potentially contaminate samples.
- Ensure decontamination personnel wear the PPE appropriate to the hazard(s) they are addressing and the specific decontamination process they perform.

Develop a decontamination plan based on the most conservative worst-case scenario and use all available information about the work area, modifying the plan when justified by supplemental information. Initially, the decontamination plan assumes all protective clothing and equipment that leave the exclusion zone are contaminated, therefore, establish a system to wash and rinse all non-disposable items/equipment and dispose of all disposables. Some considerations when developing the plan include:

- Type of equipment to be decontaminated
- Type of contaminant(s) present
- Extent of contamination
- The need for and type(s) of PPE, and
- Potential human and ecological risk scenarios

4.1. Decontamination Area/Pad Setup

Adhere to the following guidelines regarding decontamination areas:

- Identify a localized area and establish a secure perimeter for the health and safety of the public and decontamination personnel.
- Select an area where decontamination fluids and soil wastes can be controlled with minimal risk to the surrounding environment.
- Ensure the area is large enough to store cleaned equipment and materials before use, as well as for staging decontamination investigation-derived waste (IDW) drums.
- For large decontamination areas (e.g., hollow-stem auger decontamination), line with high-density polyethylene, plastic sheeting, or wood mats and include a collection system to capture potential decontamination IDW.
- Lay out the area(s) to prevent overspray during operation.

4.2. Equipment Decontamination

For equipment decontamination:

- Ensure the process does not affect the collected sample quality and integrity.
- Factory-wrapped and uncompromised disposable equipment intended for one-time use does not require decontamination before use.
- Decontaminate drilling equipment prior to beginning operations and between borings to preclude cross-contamination.
- Wash heavy equipment (e.g., excavators, backhoes, dump trucks, etc.) with high-pressure uncontaminated water, if possible, before the equipment leaves a contaminated area.
    - Consider using a portable steam-cleaner, power washer, or hand wash with a brush and detergent, followed by a freshwater rinse.
    - In some instances, it may only be necessary to thoroughly brush equipment tires and tracks with a dry brush.
- Decontaminate the sampling equipment used to collect samples for chemical analyses before each use and before sampling at a new sampling location to preclude cross-contamination.

The field manager is responsible to ensure equipment and personnel are sufficiently decontaminated prior to exiting the EZ. Document this inspection in the site log. The decontamination sequence is as follows:

- Sweep or scrape gross contamination from the item.
- Wash water-resistant items thoroughly with clean water and non-phosphate detergent.
- Collect the decontamination materials for disposal.

Note: Some sensitive measurement/monitoring equipment is not water resistant. Therefore, see the manufacturer's maintenance guidelines for decontamination instructions.

- Use a bristle brush or similar utensil, or power-wash the item if possible, using a solution to remove residual contaminants or suppress migration.
- If contaminated with heavy petroleum or chemical residues, use an appropriate solvent such as methanol, acetone, or hexane to remove the contaminants from equipment, taking extra care to contain the solvents and collect them for disposal.

- Rinse with clean water and/or distilled/deionized water. Water or moisture sensitive items may require a reagent-grade rinse.
- Inspect the equipment to ensure no contaminants remain prior to site removal and, when necessary, perform a wipe-test and analyze the results to ensure they are at a "non-detect" level before demobilizing.

All equipment should be dry before reuse. Cover items not used soon after decontamination or wrap them in new oil-free aluminum foil or new unused plastic bags to protect the equipment from fugitive contaminants before reuse. Store the decontaminated items in a secure, unexposed location out of the weather and away from any potential contaminant exposure.

Note: When taking multiple samples, particularly if taken from different locations onsite, make sure to decontaminate the sampling equipment's working elements between sampling events to preclude cross-contamination. Not doing so could compromise sample results.

4.3. Personnel Decontamination

Personnel decontamination will depend on the level and type of protective clothing, and the nature of the contamination. For specific information regarding PPE, see SOP 311, *Personal Protective Equipment*.

4.3.1. Level D

Level D decontamination includes:

- Use a segregated equipment drop to deposit non-disposable equipment, placing them on a plastic drop cloth or in separate containers with plastic liners.
- Wash and rinse outer garments, boots, and gloves, scrubbing any reusable chemical-resistant garments with decontamination solution or detergent, then rinse with clean water.
- Remove boots, gloves, and outer garment and any chemical-resistant or disposable outer garments.
- Use the field wash to thoroughly wash hands and face, and shower as soon as possible.

4.3.2. Level C

Level C decontamination includes the Level D steps, plus the following:

- Remove the tape from outer boot and glove joints and dispose of the tape in a container with a plastic liner.
- Workers leaving the EZ only to change respirator cartridges or air bottles, at this point, may exchange them, don and re-tape the outer glove and boot cover joints, then return to the EZ.
- Remove the respirator, dispose of the used cartridges in a plastic-lined container and wipe the face piece with clean water and paper towels.

4.3.3. Levels A and B

Levels A and B decontamination includes the Level C and D steps and adds:

- If a worker leaves the EZ only to change/charge their respirator bottle; exchange bottles, don and re-tape the outer glove and boot cover joints, then return to the EZ.

- When coming out of the EZ without return, remove boots, inner gloves, and outer garment (Encapsulated Suit, Level A) and place it in an appropriate container for further decontamination.

4.4. Emergency Decontamination

During an emergency, Level D (including Modified) only requires hand washing using a personal hygiene station. Only conduct full emergency decontamination for Level C and above, and only if the event is not life-threatening. In the event of a life-threatening situation, decontamination is secondary to performing cardiopulmonary resuscitation or other immediate life-saving aid. Regardless, the injured worker should be removed from the EZ prior to removing PPE and commencing life-saving measures, but only if it does not further cause injury or harm to the injured worker and/or the rescuer.

4.5. Decontamination Waste Disposal

Depending on the contaminant, collect potentially hazardous IDW (such as wash water or rinsate solutions) in 55-gallon drums and transport them to a waste storage area or directly to the Transportation Storage and Disposal Facility , depending on the client's arrangements and according to all federal, state, and local waste regulations. Additionally, dispose of all PPE and decontamination materials (i.e., tubs, brushes, etc.) in the same manner. When the contamination type and level allow, dispose of spent PPE as municipal trash after decontamination, and include the contaminated materials with excavated soils when transported by dump truck or roll-off.

5.0 RECORDS

Field personnel are responsible to document the equipment decontamination process. Record this information in the Field Notebook or on a Field Datasheet, which should include:

- Name(s) and number of decontamination personnel.
- Date and time started and ended.
- Decontamination solutions used, to include the product name, manufacturer name and lot numbers.
- Location of the decontamination area onsite.
- The methods, tools used, and observations.
- Deviations from the methods outlined in the SOP, HASP, or other safety guidance.
- Equipment identification numbers.
- Location and amount of IDW collected, stored, and/or disposed of.
- Note IDW spills or releases and associated corrective actions.

6.0 TRAINING

All personnel performing decontamination procedures are required to have the appropriate health and safety training according to SOP 308, *Health and Safety Training*, have a complete understanding of the procedures described in this SOP, and to receive specific training regarding these procedures, when necessary.

7.0 DEFINITIONS

Decontamination Area—An area that is not expected to be contaminated (i.e., outside of the EZ) and is upwind of suspected contaminants, also known as the contamination reduction zone.

Decontamination Equipment—Equipment used during the decontamination of personnel or equipment.

Decontamination—The process of removing or neutralizing contaminants that have accumulated on personnel and equipment.

Drilling and Subsurface Soil Sampling Equipment—Equipment and tools used during drilling or subsurface soil sampling.

Field Manager – EQM's field management consisting of Project Managers, Response Managers, and Site Supervisors.

Health and Safety Plan—A plan developed to ensure that all hazards associated with a site are evaluated prior to site entry.

Heavy Equipment—Earthmoving equipment generally used for excavation but can be utilized for other purposes as necessary to remove contamination from a.

Measurement/Monitoring Equipment—Equipment used to check or evaluate site contaminants for sampling, analysis, or other health and safety measurements.

Personal Protective Equipment—Personal health and safety equipment and supplies used to limit employee exposure to site contaminants.

Sampling Equipment—Equipment used during sample collection and may include measurement/monitoring equipment as noted above.

8.0 FORMS

- None

9.0 REVISION HISTORY

The EQM Vice President (VP) of QA shall ensure this procedure is reviewed at least every three (3) years and all revisions are tracked. If the Approver listed on the document is no longer responsible for the contents of this document, the VP of QA will assign a new approver.

REVISION/REVIEW HISTORY			
Date	**Rev No.**	**Purpose/Description**	**Authorized By**
07/17/2019	0	Initial issue.	D. Arthur
06/09/2020	0	Format Change, no revision	D. Arthur
02/16/2021	1	Updated to the most recent information and to rewrite to make the SOP more understandable and readable.	D. Arthur
11/15/2022	2	Revised to clarify certain aspects as well as to make the document more readable. This revision also brings the format into the 2022 pattern.	D. Arthur

10.0 REFERENCES

- *Field Standard Operating Procedures for the Decontamination of Response Personnel (FSOP 7),* EPA Office of Emergency and Remedial Response. Hazardous Response Support Division, Washington. DC. January 1985
- *OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER)*, General Industry, 29 CFR §1910.120; and Construction 29 CFR §1926.65